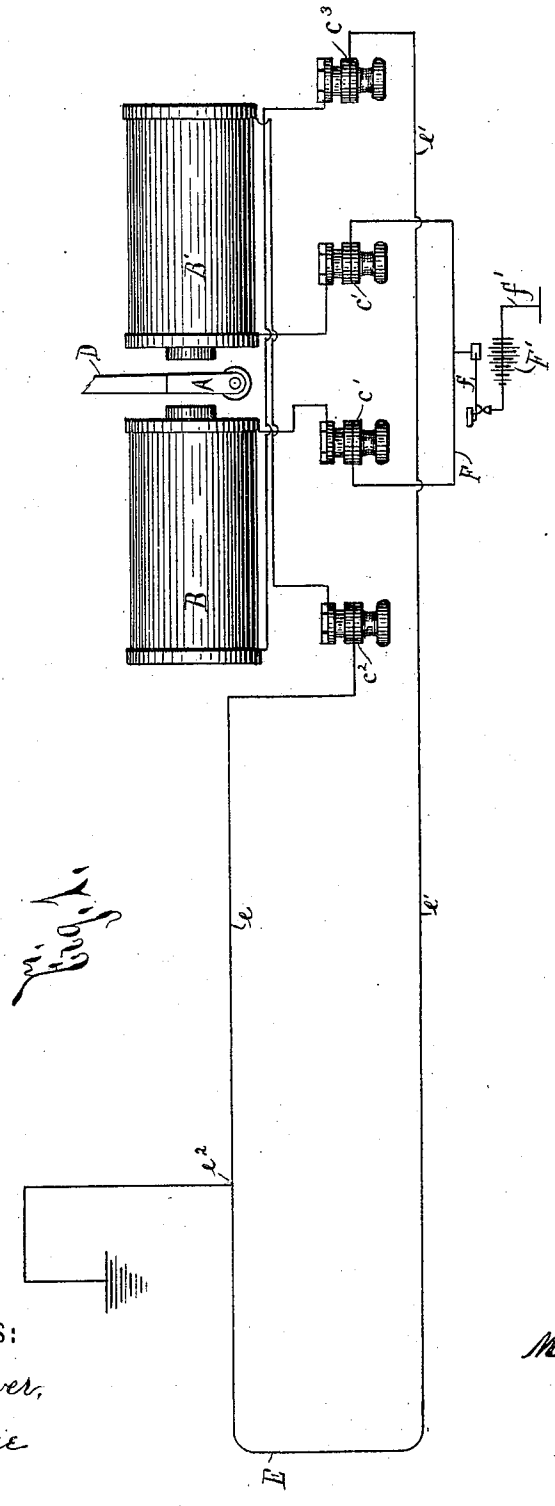
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M. J. MYERS.

DEVICE FOR LOCATING GROUNDS ON ELECTRIC CIRCUITS.

(Application filed June 17, 1896.)

(No Model.) 2 Sheets—Sheet 1.



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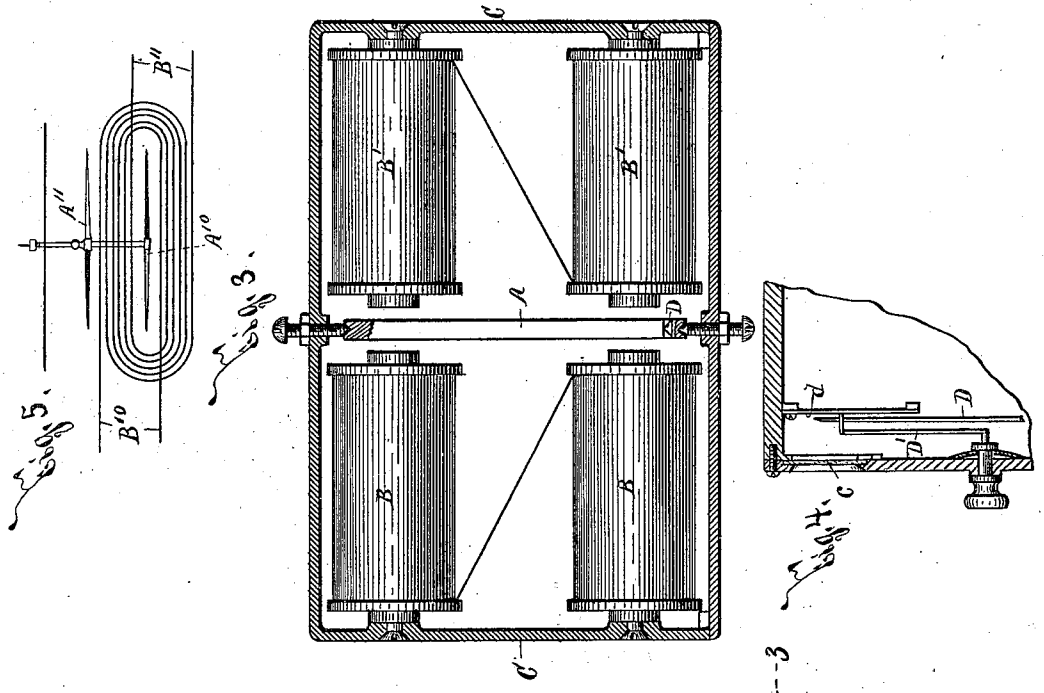
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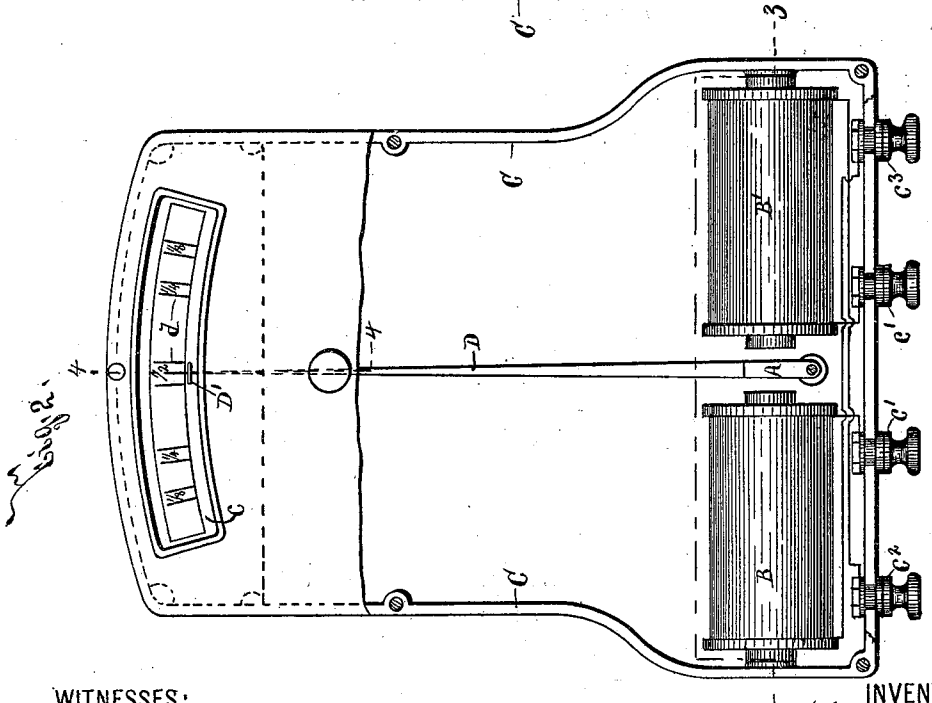
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UNITED STATES PATENT OFFICE.

MATTHEW JERVIS MYERS, OF SYRACUSE, NEW YORK.

DEVICE FOR LOCATING GROUNDS ON ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 645,603, dated March 20, 1900.

Application filed June 17, 1896. Serial No. 595,912. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW JERVIS MYERS, of Syracuse, in the county of Onondaga, in the State of New York, have invented a Device for Locating Grounds on Electric Circuits, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention consists of a device for locating grounds on electric circuits, and has for its object the production of a simple and efficient means for accomplishing the desired result, as hereinafter particularly described, and pointed out in the claims.

In describing this invention reference is had to the accompanying drawings, forming part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a diagrammatic view showing a circuit grounded at an unknown point and portions of my improved ground-locating device. Fig. 2 is a top plan, partly in section, of my improved ground-locating device. Figs. 3 and 4 are vertical sections, partly in elevation, taken respectively on lines 3 3 and 4 4, Fig. 2; and Fig. 5 is a diagrammatic view illustrating a slightly-modified construction of my invention.

A and B B′ represent, respectively, the magnetizable and magnetizing members of my improved ground-locating device. The member A preferably consists of an armature, and the members B B′, which are arranged so as to act oppositely, usually consist of electromagnets arranged on apposite sides of the armature for moving the same in different directions.

C is a suitable support, as an inclosing case, for the members A B B′, and D is an indicator, which is also arranged within the support or case C and is suitably connected to the member A and is actuated by said member and an adjuster D′. As preferably constructed the indicator D is fixed to the member A and is movable along a scale *d*, which is provided with suitable graduations and is arranged within the support or case C beneath a transparent portion *c* of its top wall.

The adjuster D′ preferably consists of a lever arranged above the free extremity of the indicator D and having one end provided with depending arms for engaging opposite sides of the indicator. The opposite end of the adjuster is provided with an upwardly-extending arm pivoted in the top wall of the support or case C and provided with a hand-engaging portion arranged above said top wall. The adjacent ends of the electromagnets, which preferably form the members B′ B, are connected to binding-posts c' c', and the opposite ends of said electromagnets are connected to binding-posts c^2 c^3.

In the use of my improved ground-locating device the circuit E, grounded at an unknown point, as e^2, is broken at any given point, and the respective terminals or ends of the opposite branches or limbs e e' of said circuit are then connected to the binding-posts c^2 c^3. The binding-posts c' c' are connected by a conductor F, and a key or switch f is connected to said conductor and to one pole of a source of electric energy, as a battery F′, having its opposite pole connected to the ground by a conductor f'.

It is obvious that the magnetizable and magnetizing members of my improved ground-locating device do not necessarily consist of an armature and oppositely-arranged electromagnets, and at Fig. 5 I have shown, diagrammatically, two magnetized needles A^{10} A^{11} and oppositely-arranged coils B^{10} B^{11}, which operate to move said needles in opposite directions and may be connected to each other and the grounded circuit in the same manner as the members B B′.

In the operation of my invention the branches e e' of the circuit E, grounded at an unknown point, are connected to the binding-posts c^2 c^3. The conductor F is connected to the binding-posts c' c' and the key or switch f is actuated, whereupon the current flows from the battery F′ in substantially-equal quantities in opposite directions through the members B B′ and the grounded branches or limbs e e' of the circuit E. The members B B′ are energized by the passing current and tend to move the member A in opposite directions, and the adjuster D′ is operated to adjust the indicator D, and thereby change the position of the member A until it assumes a position where it is attracted with equal force by both members B B′. If the unknown ground of the circuit E is midway between its opposite branches or limbs e e', the resist-

ances through which the current flows in opposite directions over said circuit E to the ground from the battery F′ are substantially equal. Consequently the member A is attracted with substantially-equal force by each of the members B B′, and when the indicator is properly adjusted it will remain in its normal position. On the contrary, if the unknown ground is located at either side of said central position the resistances through which the current flows over the circuit E are unequal, and one of the members B B′ will tend to attract the member A with greater force than the other magnetizing member. In this event the indicator D when properly adjusted is caused to assume a position upon the scale *d* corresponding to the position of the unknown ground on the circuit E, and the user of my improved ground-locating device is then informed of the position of said unknown ground.

My improved device for ascertaining the position of grounds on electric circuits will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be particularly noted that I do not herein specifically limit myself to the exact detail construction and arrangement of the component parts of said ground-locating device.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device for locating an unknown ground on a metallic electric circuit, the combination of an indicator for determining the position of the ground, oppositely-acting magnetizing members for moving the indicator in different directions, said members being connected respectively to the branches or limbs of the circuit, and a source of electric energy connected to the ground and to both magnetizing members, substantially as and for the purpose described.

2. In a device for locating an unknown ground on a metallic electric circuit, the combination of an indicator for determining the position of the ground, oppositely-acting magnetizing members for moving the indicator in different directions, said members being connected respectively to the branches or limbs of the circuit, a source of electric energy connected to the ground and to both magnetizing members, and an adjuster for varying the position of the indicator, substantially as and for the purpose specified.

3. In a device for locating an unknown ground on a metallic electric circuit, the combination of an indicator, oppositely-acting magnetizing members for moving the indicator in different directions, means for respectively connecting the magnetizing members to the branches or limbs of said circuit, a grounded source of electric energy, and means for connecting said source of electric energy to both magnetizing members and thereby passing a current through the same simultaneously, substantially as and for the purpose specified.

4. In a device for locating an unknown ground on a metallic electric circuit, the combination of an indicator, oppositely-acting magnetizing members for moving the indicator in different directions, said members having corresponding ends connected together, means for respectively connecting the opposite ends of the magnetizing members to the branches or limbs of said circuit, a grounded source of electric energy, and a switch connected to said source of electric energy and to the connection between said members, substantially as and for the purpose set forth.

5. In a device for locating an unknown ground on a metallic electric circuit, the combination of a scale, an indicator movable along the scale, oppositely-acting magnetizing members for moving the indicator in different directions, means for respectively connecting the magnetizing members to the branches or limbs of said circuit, a grounded source of electric energy, and means for connecting said source of electric energy to both magnetizing members and thereby passing a current through the same simultaneously, substantially as and for the purpose described.

6. In a device for locating an unknown ground on a metallic electric circuit, the combination of an indicator, an armature movable in a substantially-horizontal plane for actuating the indicator, magnetizing members, as magnets, arranged on opposite sides of the armature for moving the indicator in different directions, means for respectively connecting the magnetizing members to the branches or limbs of said circuit, a grounded source of electric energy, and means for connecting said source of electric energy to both magnetizing members and thereby passing a current through the same simultaneously, substantially as and for the purpose set forth.

7. In a device for locating an unknown ground on a metallic electric circuit, the combination of an indicator, an armature movable in a substantially-horizontal plane for actuating the indicator, magnetizing members, as magnets, arranged on opposite sides of the armature for moving the indicator in different directions, means for respectively connecting the magnetizing members to the branches or limbs of said circuit, a grounded source of electric energy, means for connecting said source of electric energy to both magnetizing members and thereby passing a current through the same simultaneously, and an adjuster for varying the position of the armature, substantially as and for the purpose described.

8. In a device for locating an unknown ground on a metallic electric circuit, the combination of a scale, an indicator movable along the scale, and having an armature fixed thereto, magnetizing members, as magnets, arranged on opposite sides of the armature

for moving the indicator in different directions, means for respectively connecting the magnetizing members to the branches or limbs of said circuit, a grounded source of electric energy, and means for connecting said source of electric energy to both magnetizing members and thereby passing a current through the same simultaneously, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 30th day of May, 1896.

M. JERVIS MYERS.

Witnesses:
E. A. WEISBURG,
K. H. THEOBALD.